

BARRIERS TO THE DEVELOPMENT OF POLISH SME IN THE LIGHT OF THE RESEARCH RESULTS ON INNOVATIVENESS OF THE ECONOMY AND COMPANIES

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Abstract. Innovations and the ability to create and introduce them are recognized in the modern economy as the driving forces of development in micro-, mezzo- and macro scale. This means that the innovative abilities of small and medium-sized companies in Poland determine their development, as well as competitiveness. The hitherto studies on the innovativeness of Polish economy and its SMEs indicate that for many years, only a small part of them use innovation as a measure for development. This is the result of many barriers present in both Polish economy and within these companies. They are diverse in nature. External companies' innovativeness limits include economic, social, political, legal, cultural, technological, capital and market aspects. The internal determinants of this phenomenon include available resources, effective systems of communication, innovation-oriented organizational culture and leadership, the quality of human capital and creativity, as well as the structural determinants and sociological and psychological factors. All these areas may make up for the company development barriers or opportunities. The aim of the article is to present barriers to the SMEs development in Poland in the context of their innovativeness barriers. Using data from the reports of the European Commission, Innovation Union Scoreboard, Community Innovation Survey and the papers by Polish Agency of Entrepreneurship Development and the Main Statistical Office, the author has identified the cause of low innovativeness of Polish SMEs. This diagnosis makes easier taking by the state and enterprises appropriate measures to reduce those barriers.

Key words: SME, innovation, company development, barriers.

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Introduction

In the twenty-first century, innovations are considered the major factor for the development of a company. In the turbulent economy, subjected to cyclical fluctuations and surviving dynamic market changes, the ability to implement system innovations determines the success of the company and its development and competitive advantage. This rule applies not only to companies in developed states (the innovation leaders) and high technology sectors. The companies from states with low levels of innovation (e.g. Poland) - in all sectors (of high, medium and low technology) must also cope with this challenge. The innovation as a factor of development is used by all business entities, regardless of their size and branch. In the modern economy, the companies that know how to mobilize the knowledge, technology, human resources, financial resources, experience and cooperation to develop, implement and disseminate new solutions (Tidd Bessant, 2011) can cope best. The innovative activity of the company may be the result of generating innovation within the internal actions (the use of

their own R&D potential and creativity of employees), obtaining new solutions from external sources (from other companies, universities, research institutes) or through cooperation with various stakeholders of innovative processes. The use of innovation for companies' development and success is hindered by innovation barriers (Coad et al., 2014). They are formed by external and internal factors. External conditions for innovative companies include economic, social, political, legal, cultural, technological, capital and market factors. The internal determinants of this phenomenon include available resources, effective system of communication, innovation-oriented organizational culture and leadership, the quality of human capital and creativity, as well as the structural determinants and sociological and psychological factors. These conditions are often especially strong barriers, in the case of small and medium-sized enterprises, in the States of low level of innovation, placed at the end of the Innovation Union Scoreboard ranking. These States include Poland and some other post-socialist States of Central and Eastern Europe.

The importance of innovation in the micro-, mezzo- and macro scale is growing, thus the innovation policy and the policy of supporting SMEs in this area become an important part of economic policy in many Member states. As Czerniak (2013) indicates, the innovation policy is to 'increase the capacity of enterprises, individual branches of industry and the entire economy to introduce innovations and to facilitate the dissemination and transfer of innovation' (p. 30). The recognition of the barriers to businesses development related to their innovative capabilities shall ensure an appropriate orientation of innovation policy towards small and medium-sized enterprises in Poland and other Member states belonging to the modest and moderate innovators.

Research results and discussion

The purpose of this paper is to present barriers to development of small and medium-sized enterprises under the impact of barriers to innovativeness. It was recognized that in today's economy, these barriers are a fundamental limitation of the SMEs development. For this purpose, studies have been undertaken on the level of innovation of the Polish economy in comparison to EU states, covering the years 2008 to 2016. The adopted scope of analysis allows us to evaluate innovation change trends in Poland after the integration with the EU. The basis for these analyses were reports of the European Commission's Innovation Union Scoreboard (by 2010, these reports had been called European Innovation Scoreboard). The study on the changes in the synthetic index of innovation - Summary Innovation Index (SII) and its sub-indices made it possible to find strengths and weaknesses of Polish innovation. Due to the construction of SII index, which includes indices related to the activities of SMEs in the field of innovation and the results of this activity, the involvement of Polish SMEs in innovative activity and its effects may be assessed on this basis. The study identified barriers to innovation, which

small and medium-sized companies still face in Poland. The analyses conducted revealed that the Member states included in the group of modest and moderate innovators from Central and Eastern Europe have similar weaknesses of innovation, which suggests their sharing of similar barriers to innovation as in Poland.

Additionally, to illustrate the innovativeness of these companies compared to other EU Member states, the analysis of Eurostat data from the Community Innovation Survey 2012 report made for the Polish Agency for Enterprise Development PAED (Zadura-Lichota ed., 2015) was used. Conclusions from these studies made it possible to identify the causes of long-term low innovativeness of small and medium-sized companies in Poland, reveal their similarities with other EU Member states and to indicate the directions of Polish innovation policy, which could reduce these limitations.

To prepare the paper, the following information resources were used: the domestic and foreign literature, Innovation Union Scoreboard 2016 (2016) report, dedicated to the innovation of the Community Member States and Eurostat data on various aspects of innovative European companies from various sectors of the economy (Community Innovation Survey 2012, 2012 processed by PAED analysts). The research methods used in the work include the study of literature and comparative analysis.

To assess the innovativeness of the EU Member States, the European Commission applies a specific methodology (Hollanders, Tarantola, 2011, Innovation Union Scoreboard 2016, 2016), which allows to calculate the synthetic Summary Innovation Index (SII). Its components are partial indices relating to three areas of innovation. They describe the environment necessary for the innovation to occur (the so-called driving forces), the innovative activity of small and medium-sized enterprises and the results of innovative activities in different dimensions. Categories of indices in 8

dimensions of innovation are assigned to the individual components of Innovation. All in all, this makes up a set of 25 indices, which show the details of each State innovativeness. Three dimensions of innovation are described by the following topics: innovation driving forces (8 indices), enterprises' innovative activity (9 indices) and effects of innovation activity (8 indices).

The SII complex innovation index, which was created, allows dividing EU Member states into 4 groups: 'innovation leaders', 'strong innovators', 'moderate innovators' and 'modest innovators'. Given the recent study of innovation for 2016, the individual groups of states include (SII value in brackets):

- 1) innovation leaders - Sweden (0.704), Denmark (0.700), Finland (0.649), Germany (0.632) and Netherlands (0.631);
- 2) strong innovators - Ireland (0.609), Belgium (0.602), the United Kingdom (0.602), Luxembourg (0.598), Austria (0.591), France (0.568);
- 3) moderate innovators - Slovenia (0.485), Cyprus (0.451), Estonia (0.448), Malta (0.437), the Czech Republic (0.434), Italy (0.432), Portugal (0.419), Greece (0.364), Spain (0.361), Hungary (0.355), Slovakia (0.355), Poland (0.292), Lithuania (0.282), Latvia (0.281), Croatia (0.280);
- 4) modest innovators - Bulgaria (0.242), Romania (0.180).

Changes in this index for the Union and its individual Member States between the years 2008 and 2015 are presented in Table 1. The data come from the Innovation Union Scoreboard 2016 (2016).

The data in Table 1 show that Poland was classified between 2008 and 2015 in the group of 'moderate'. Every time, it occupied the lowest positions in the EU States ranking of innovation, whose number between 2008 and 2015 was changed from 25 to 28 members (e.g. in 2009, it had 23rd place amongst 27 states, and in 2015, it

was also on 23rd place amongst the 28 EU States). A comparison between the SII national summary values of innovation indices with the SII average for the EU or with SII indices for individual States allows finding out the distance that separates the Member state studied from the other members of the group.

The latest report of the European Commission's Innovation Union Scoreboard 2016 (2016) shows that in 2015, Poland reached 56.04 % of the average SII rate for the EU Member States. This allowed Poland to keep up its place among moderate innovators. In this group, the states, reaching between 50 % and 90 % of the average rate for the entire EU can be found). In 2008, this ratio was 58.19 % and in 2014, only 55.64 %. The recent 2015 score (56.04 %) may indicate a return to a growth trend. Changes in this ratio suggest that in the period under study, Poland slowly reduced not only the gap to leaders in innovation, but even to other Member states, belonging to the moderate innovators with favorable relations of their summary innovation index to its EU average. Amongst them, there are most of the Member states which entered the European Union together with Poland between 2004 and 2007 (excluding Romania, Bulgaria, Latvia and in some years Lithuania). This is also indicated by SII indices higher compared to Poland between 2008 and 2015 in such Member states as Slovenia, Estonia, the Czech Republic, Cyprus, Malta, Hungary, Slovakia and sometimes Lithuania.

At the accession, six Member states from this group, along with Poland belonged to the same post-communist block, and yet, in the period under study, they had better results than our country in terms of innovation. Despite the passage of years, this status has not improved. Poland has not been able to catch up with the technological gap even in relation to certain Member states of Central and Eastern Europe. This is evidenced by the growth rates of the summary innovation index, which in the case of

Poland in the years between 2008 and 2015 were always much lower than in other Member states, which together with Poland joined the European Union, even those at the end of innovation ranking (Table 1).

To understand the reasons for low innovativeness of Polish economy (and consequently its small and medium-sized enterprises), it was needed to analyse partial innovation indices in three areas: driving forces, innovation, entrepreneurship and innovation effects in the economy. This was carried out for 2015. That year data are similar to the values in earlier years, although they have improved. They also confirm the occurrence of the same restrictions of innovation in our economy in this period. The 2015 values of partial indices of innovation in Poland and other EU Member States are shown in Table 2.

An analysis of the recent report and the previous one of the European Commission on the innovation of the EU Members (Innovation Union Scoreboard 2016, 2016), gives the right to conclude that very good innovation indices of the innovation leaders are caused by the impact of some interrelated factors. They determine the success in innovation designing and introducing and in using it for the needs of enterprises and the economy. These include: efficient, open and effective research systems, well developed university education, perfectly developed entrepreneurial innovation (adequately supported in the framework of innovation policy) and the occurrence of well organized, multilateral links in the innovation process, resulting not only between businesses but also between businesses and institutions of science and research sector and in the area of science and research. The

world of science is closely linked with the world economy, not only by providing well qualified staff for the economy, but also by participating in the creation, transfer and diffusion of innovation. This is confirmed by the data on the innovation leaders, which describe the indices related to individual components of innovation in Table 2. If an analysis of partial indices of EU Member States innovation for each of the years from 2008 to 2015 were carried out, such a regularity would be noted. The European Commission experts indicate that the factors listed above should be considered the strengths of 'innovation leaders' and the rising rates in these areas of other 'strong innovators' States show the direction for the improvement of SII.

What constitutes a strength of innovation leaders and their followers turns out to be weaknesses of Poland and other Member States at the end of the innovation ranking. These include the 'old' and 'new' EU Member States, both post-communist states and those which have always had the capitalist system.

However, the weakest innovation performance measured by SII and partial indices have been noted in the period under study by the former Eastern block states such as Romania, Bulgaria, Latvia, Lithuania, Croatia, Poland, Slovakia, and Hungary. Only three post-communist states - Slovenia, Estonia, and the Czech Republic - had much better results. Slovenia was classified as a representative of the 'moderate innovators' (in 2014 - 'innovation followers'), and the two other states have achieved innovation results close to the EU-average that approximated them to the group of 'strong innovators' (although they belonged to the 'moderate innovators').

SII of the European Union and its Member States in 2008-2015

No	States	2008	2009	2010	2011	2012	2013	2014	2015	Growth rate (%)
1.	EU28	0.495	0.502	0.511	0.514	0.519	0.521	0.523	0.521	0.74
2.	Belgium	0.564	0.576	0.578	0.588	0.592	0.596	0.607	0.602	0.93
3.	Bulgaria	0.219	0.209	0.230	0.238	0.240	0.210	0.238	0.242	1.40
4.	Czech Republic	0.413	0.412	0.422	0.440	0.442	0.421	0.433	0.434	0.71
5.	Denmark	0.624	0.630	0.639	0.678	0.694	0.693	0.675	0.700	1.67
6.	Germany	0.624	0.636	0.654	0.655	0.667	0.661	0.655	0.632	0.16
7.	Estonia	0.416	0.441	0.469	0.468	0.505	0.490	0.479	0.448	1.06
8.	Ireland	0.584	0.596	0.617	0.619	0.627	0.601	0.607	0.609	0.58
9.	Greece	0.370	0.364	0.368	0.371	0.375	0.386	0.399	0.364	-0.21
10.	Spain	0.381	0.386	0.389	0.386	0.388	0.394	0.387	0.361	-0.76
11.	France	0.539	0.550	0.560	0.562	0.566	0.560	0.556	0.568	0.76
12.	Croatia	0.299	0.293	0.291	0.302	0.304	0.298	0.292	0.280	-0.92
13.	Italy	0.389	0.400	0.407	0.418	0.416	0.425	0.434	0.432	1.53
14.	Cyprus	0.470	0.474	0.476	0.488	0.491	0.480	0.487	0.451	-0,57
15.	Latvia	0.214	0.217	0.224	0.234	0.247	0.215	0.233	0.281	3.99
16.	Lithuania	0.239	0.238	0.252	0.256	0.268	0.275	0.288	0.282	2.39
17.	Luxembourg	0.632	0.646	0.632	0.619	0.623	0.646	0.626	0.598	-0.79
18.	Hungary	0.345	0.343	0.354	0.358	0.363	0.355	0.364	0.355	0.39
19.	Malta	0.342	0.354	0.351	0.326	0.334	0.379	0.371	0.437	3.57
20.	Netherlands	0.549	0.563	0.573	0.580	0.586	0.631	0.639	0.631	2.03
21.	Austria	0.585	0.598	0.608	0.577	0.581	0.604	0.599	0.591	0.21
22.	Poland	0.290	0.298	0.299	0.291	0.296	0.286	0.291	0.292	0.10
23.	Portugal	0.393	0.403	0.401	0.404	0.405	0.401	0.418	0.419	0.90
24.	Romania	0.246	0.255	0.264	0.263	0.261	0.228	0.223	0.180	-4.38
25.	Slovenia	0.446	0.453	0.464	0.479	0.491	0.476	0.498	0.485	1.18
25.	Slovakia	0.318	0.329	0.338	0.325	0.313	0.346	0.354	0.350	1.39
27.	Finland	0.663	0.668	0.671	0.651	0.651	0.642	0.658	0.649	-0.290
28.	Sweden	0.697	0.709	0.718	0.714	0.717	0.722	0.719	0.704	0.14
29.	United Kingdom	0.525	0.529	0.542	0.560	0.566	0.569	0.580	0.602	1.98

Source: author's developed Table based on: *Innovation Union Scoreboard 2016, European Commission, 2016*, http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards_pl (access: 10.01.2017).

Component indices of innovation groups of EU Member States in 2015

No	Country/ies	Innovation driving force			Entrepreneurs activity			Result of innovative activity	
		Human resources	Research system	Finance and support	Firms investments	Linkages & Entrepreneurship	Intellectual assets	Innovators	Economics effects
1.	EU28	0.575	0.466	0.490	0.426	0.473	0.556	0.526	0.573
		Innovation leaders							
2.	Sweden	0.831	0.814	0.710	0.619	0.689	0.728	0.640	0.622
3.	Danmark	0.703	0.765	0.654	0.459	0.767	0.789	0.624	0.709
4.	Finland	0.783	0.625	0.765	0.500	0.676	0.716	0.595	0.561
5.	Netherlands	0.653	0.774	0.663	0.237	0.727	0.624	0.542	0.681
		Strong innovators							
6.	Ireland	0.816	0.582	0.363	0.300	0.593	0.426	0.773	0.777
7.	Belgium	0.622	0.768	0.502	0.492	0.814	0.487	0.565	0.561
8.	United Kingdom	0.786	0.795	0.506	0.270	0.591	0.502	0.519	0.681
9.	Luksembourg	0.431	0.771	0.372	0.136	0.544	0.720	0.704	0.742
10.	Austria	0.650	0.561	0.538	0.517	0.629	0.707	0.647	0.475
11.	France	0.657	0.678	0.566	0.363	0.505	0.488	0.663	0.578
		Moderate innovators							
12.	Slovenia	0.829	0.386	0.241	0.472	0.576	0.484	0.420	0.424
13.	Cyprus	0.662	0.392	0.278	0.153	0.454	0.403	0.621	0.485
14.	Estonia	0.554	0.340	0.727	0.555	0.456	0.426	0.422	0.323
15.	Malta	0.274	0.258	0.100	0.423	0.276	0.645	0.624	0.602
16.	Czech Republic	0.561	0.300	0.446	0.404	0.422	0.336	0.473	0.505
17.	Italy	0.407	0.398	0.279	0.277	0.418	0.505	0.577	0.456
18.	Portugal	0.591	0.453	0.471	0.260	0.378	0.385	0.513	0.332
19.	Greece	0.562	0.408	0.224	0.281	0.412	0.243	0.471	0.322
20.	Spain	0.448	0.413	0.357	0.185	0.236	0.437	0.250	0.432
21.	Hungary	0.462	0.218	0.272	0.367	0.206	0.281	0.319	0.570
22.	Slovakia	0.642	0.166	0.255	0.267	0.209	0.239	0.415	0.490
23.	Poland	0.556	0.125	0.274	0.361	0.094	0.391	0.210	0.310
24.	Lithuania	0.726	0.134	0.538	0.352	0.167	0.256	0.109	0.168
25.	Latvia	0.534	0.168	0.424	0.426	0.105	0.326	0.113	0.255
25.	Croatia	0.606	0.160	0.287	0.324	0.271	0.218	0.190	0.247
		Modest innovators							
27.	Bulgaria	0.498	0.087	0.104	0.212	0.071	0.500	0.186	0.176
28.	Romania	0.392	0.111	0.070	0.084	0.045	0.149	0.193	0.273

Source: author's developed Table based on: Innovation Union Scoreboard 2016, European Commission, 2016, http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards_pl (access: 10.01.2017).

In the case of Poland, this could be assessed by analysing partial indices of such innovation components in which Poland performs below the EU States average:

- research systems – a small number of joint international scientific papers, a small number of scientific papers being cited, a very insignificant share of foreign doctoral students

from outside the European Union. This proves a small internationalization of Polish scientific community, the occurrence of very few open research systems which are not very effective;

- funding and support - public sector spending on research and development lower than the EU average along with little involvement of venture capital investments in innovation. It proves a poorly developed system of innovation processes capital support and a reduced funds availability for businesses from non-bank sources to spend on innovation, accepting high-risk coming from innovation;
- business investments into innovation - low spending on research and development incurred by enterprises, which reveals improper innovation financing structure in Poland (public sector spending thereon is greater than the private sector);
- very poor and undeveloped links of SMEs in the innovation processes indicated by: a low rate of internal innovation, low level of small and medium-sized innovative companies, cooperating while creating innovation and a very low rate of papers drawn up jointly by representatives of public and private sectors (the sectors of science and the economy);
- rights obtained to intellectual property - very low rates, relating to the number of patent applications, particularly patent applications in the field of social changes (challenges), and of any EU trademarks held. These poor results indicate that enterprises innovation activities undertaken in too small extent give insignificant effects in the form of inventions and trademarks that companies try to protect;
- small percentage of SMEs' innovative companies - indices that lay down the share of small and medium-sized companies, introducing product and process innovations, as well as implementing marketing and / or organizational innovation show that;
- unsatisfactory economic performance of innovative activity in the country; they are

expressed first of all by such indices as revenues from licenses and patents sold abroad, sales of new solutions for the market and for companies, the volume of exports related to knowledge-based services.

The above-mentioned poor areas of innovation related to the functioning of both the public and private sectors in the innovation processes indicate the occurrence of strong barriers to the innovation in small and medium-sized enterprises in Poland, which will be described in details further below.

To support the above considerations on the low innovativeness of Polish economy (in particular SMEs) and its reasons, the data developed by Polish Agency for Enterprise Development, dedicated to the innovative activities of domestic companies against the achievements of other EU Member States (Zadura-Lichota, 2015, pp. 11- 46) were used. In this study, the Eurostat data from an international statistical research programme of innovation, Community Innovation Survey 2012, are cited and analysed (held in all European Union Member States periodically, once every three years - the last one covered the years from 2010 to 2012).

The enterprises' involvement in innovation activities can be assessed on the basis of the share of companies carrying out such activity amongst the total number of enterprises. Between 2010 and 2012, this rate was highest in Germany (66.9 %), Luxembourg (66.1 %), Ireland (58.7 %), Italy (56.1 %), Sweden (55.9 %) and Belgium (55.6 %). At the other end of the ranking, leaders in innovation were such Member States as Romania (20.7 %), Poland (23.0 %), Bulgaria (27.4 %), Latvia (30.4 %), Hungary (32.5 %), Lithuania (34.5 %) with the lowest shares of companies, leading innovative activities. This index shows a significant gap between Poland and the most developed Member States, but even other post-communist countries. Besides the above-mentioned, Member States

from the former Eastern block, Slovakia (34 %), Croatia (37.9 %), Czech Republic (43.9 %), Slovenia (46.5 %) and Estonia (47.6 %) had also a higher percentage of innovative companies than Poland.

Polish achievements in this area can be compared with the Member States that have similar levels of economic development by setting out the relationship of GDP per capita, calculated according to the purchasing power parity and expressed in a common notional currency PPS (Purchasing Power Standard) and the share of enterprises engaged in innovation activities. In this case, Poland derogates strongly or very strongly from the achievements of other states in Central and Eastern Europe, with a similar or slightly lower level of economic development (Lithuania, Slovakia, the Czech Republic, Estonia etc.).

In Poland, in the group of medium-sized enterprises (with those employed, ranging from 50 to 249), only 35.8 % of companies undertook innovation activities, while the average index for the EU was 60.5 %. Besides Romania (26.6 % of innovative medium-sized companies), all EU Member States had higher rates compared to Poland. In the group of post-communist states, Estonia (64.3 %), Slovenia (62 %) and the Czech Republic (57.6 %) had the highest medium-sized enterprises activity in the innovation. Analysing the share of small businesses, engaged in innovation activities, it can be said that Poland obtained the worst result. Only 17.4 % of entities employing 10 to 49 people did show commitment to such activities. The average index for the whole Community in this group amounted to 45.2 %, but in the Member States belonging to the innovation leaders and the followers of the leaders, this percentage ranged between 40.5 % and 63.4 % (Zadura-Lichota, 2015, p. 15).

The data presented in the paper by PAED show a dramatically low share of small and medium-sized enterprises (dominant in the structure of the economy) that undertake

innovative activities. The analyses of other indices, i.e. the share of small and medium-sized enterprises, implementing technological innovation further confirm that the innovativeness of SMEs in Poland is very weak. Only 11 % of small and 12 % of medium-sized companies introduced a technological innovation (products and processes) between 2010 and 2012. For comparison in the same period: 51 % of small and 63 % of medium-sized German companies, and among the Member States of Central and Eastern Europe - 30 % of small and 49 % of medium-sized Czech companies did it (Zadura-Lichota, 2015, p. 17).

When analysing the total outlays per 1 company, running an innovative activity between 2010 and 2012, it can be seen that Poland had the 12th place (1 005 K Euros) amongst EU Member States, although, these values were shaped a bit differently, depending on the size of businesses. In the group of small companies, Poland had the 19th place (120 K Euros), in the group of medium-sized enterprises it had the 14th place (627 K Euro) and in the group of big companies 17th place (5 068 K Euros) (Zadura-Lichota, 2015, pp. 24-26).

At the same time, the situation of the Polish entities' external research and development was even worse (20th place among EU members) with 19 % share of this type of enterprises. This is caused by insufficient cooperation between companies engaged in innovation and research and development with various stakeholders (suppliers, customers, other businesses, government bodies, universities, research centres, consulting firms etc.). Between 2010 and 2012, only 19.6 % of small entities (showing innovation) cooperated in innovation, and in the case of medium-sized ones - 37.2 %. In consequence of insignificant innovation, the indices, describing the benefits of innovative and R&D activity (i.e the sales value of products new to the company or new to the market) are below the EU average (Zadura-Lichota, 2015,

pp. 26-31). One of the symptoms of this lack of cooperation in innovative activities with public authorities is a small percentage of companies, using public support for innovation. In 2012, 23.2 % of innovative companies benefited from this mechanism from various public sources. Only 4.6 % of entities did receive public support from local self-governments or local bodies of government administration, 8.4 % of companies from bodies of central government, 19.5 % of innovative enterprises availed themselves of EU funds, and 3.8 % of innovative entities used measures of the Framework Programme.

The Eurostat survey of Community Innovation Survey 2012 also revealed material obstacles to achieving the objectives of innovative firms indicated by European entrepreneurs. They might be associated with the failure to undertake any innovative activity, its introduction slowed or lack of results expected from this activity. Entrepreneurs from EU states invoked such causes as high costs of access to new markets, innovation by competitors, the dominant share in the competitive market, the lack of sufficient funds, lack of demand, strong price competition, lack of qualified staff, strong competition as to the quality of product, the opinion about them or their brand, high costs associated with adjustment to government and legal regulations. Polish entrepreneurs recognized as the most burdensome obstacle to achieving the objectives of innovation: strong price competition (48.6 % of respondents), strong competition in terms of product quality, opinions about them or their brand (26.1 % of respondents), lack of demand (23.5 %), high costs associated with government and legal regulations (19.5 %), lack of sufficient funds, financial resources (20.2 %), high costs of access to new markets (17.8 %), the dominant share in competitive market (17.3 %), innovation introduced by competitors (13 %) and lack of qualified personnel (9.7 %). This outcome is the resultant of the answers given by entrepreneurs, belonging to various size enterprises and there is

a reason to consider that if answers by representatives of SMEs were separated, the distribution of these results would have been somewhat different.

The study on the innovation of the Polish economy and its businesses helped to identify the weaknesses and difficulties in all areas of innovation, i.e. in terms of innovation driving forces, enterprise innovation activity and its effects for businesses and the economy. They affect to the biggest extent SMEs, holders of lesser economic potential, as many of their owners rarely show pro-innovation attitude, failing to bear in mind the fact that the former price competitive advantages are no longer sufficient in today's economy.

In contrast, other entrepreneurs in the sector who would like to use innovation to contribute to the growth and development of their companies face financial capital barriers, difficulties with access to new solutions offered by academic and research institutions (overestimated in the opinion of entrepreneurs). Then, there are cost barriers, arising from the fact that innovation processes require large expenditures. Due to the risk of failure related with research and development (R&D) or innovation tasks, these expenditures need not be returned or may bring a benefit smaller than intended. The distribution of costs and risks of innovation amongst a larger group of entities within the framework of cooperation during innovation processes would favour the reduction of such barriers. It would facilitate the access to sources of financing innovation, the knowledge, technology, or other missing individual SMEs resources. To establish cooperation during innovative and R&D activity, it would be necessary to change the mental outlook of Polish small and medium-sized enterprises, reluctant to cooperate with partners other than firms, that have little confidence in other participants of economic processes, in authorities and economic policy. It would be also necessary to change their market attitude to pro-

innovation, to reduce financial barriers and to increase the access to high risk capital.

The access to capital and resources for innovative and R&D activities is difficult due to the fact that outlays on these purposes are relatively low, and in consequence, the effects of these activities in the form of new patents, trademarks are modest. Only 23 % of all companies in Poland (17.4 % of small and 35.8 % of medium-sized enterprises) operate innovative business, and only a few of them protect their rights of ownership with the use of patents and trademarks (protection procedures and high costs thereof make up the barrier in this case). Benefits from sales of products and services new to market or new to company are recorded by few small and medium-sized enterprises. Undoubtedly, it has an impact on their growth and development.

Problems with innovation funding and reluctance of entrepreneurs in this sector to go into innovation activities (neglecting the importance of innovation for the growth and development of the company) result from the fact that the structure of innovation financing is distorted in Poland. The public sector expenditures still prevail, although the private sector share is increasing (companies spending on R&D has risen in relation to GDP) from 0.17 % in 2007 to 0.19 % in 2009 and to 0.38 % in 2013 (Nauka i technika w 2009 r., 2011, p. 85; Nauka i technika w 2015 r., 2016, p. 11).

Based on the research, it can also be noticed that the barriers to SMEs' innovation result from weakness, insufficient openness and low efficiency of Polish research systems. They are related to small internationalization of Polish science, little involvement of Polish scientists in international projects (performing tests on the need to implement solutions in industry or services), exchange of staff, knowledge and skills, limited capacity of Polish scientists to transfer knowledge and technology to our economy in order to commercialize new

solutions, limited technology offer appropriately adjusted to the needs of entrepreneurs in the SMEs sector, weak links between scientists and entrepreneurs because of stereotype partner perception by either party (Lacka 2011). In the opinion of entrepreneurs, bureaucratic barriers and the inability of scientists to act in the market (e.g. quick preparation of new solutions as commissioned by companies) do not incline to establish innovation cooperation.

Too modest, inadequately adjusted technological offer from scientists and too little supply of ready to apply new solutions within the framework of knowledge transfer and commercialization of new technologies in this sector constitute a barrier to SMEs' innovation when they do not undertake their own research and development. In consequence, the innovative potential of Polish SMEs is limited, and the potential use of technological and non-technological innovation for enterprise development is very limited.

Conclusions, proposals, recommendations

Comparative studies over Polish innovation at the background of other European Union Member States revealed large gaps in the level between Poland and developed Member States, but also to the Member States of the same, and sometimes a little lower development level (calculated on the basis of PPP). Poland has been improving its innovative indices, but it does it too slowly, not being able to catch up with the technological distance from other European Union States. This is confirmed by the country's place at the end of the annual innovation rankings.

The earlier support for innovative and R&D activity in the country in scope of the innovation policy brings positive results very slowly. Delayed undertaking of this action and the initial innovation policy errors, the neglect of the reform in science, too modest and targeted improperly entrepreneurship, functions and innovation of SMEs have resulted in the occurrence of many barriers to innovation in the Polish economy.

The study of the innovation of the Polish economy and its businesses allowed finding out barriers to creating, deployment and diffusion of SMEs innovation. They do not exhaust all the issues related to barriers to the development of

these entities in contemporary economy, but allow recognizing the weakness of Polish innovation system, which significantly reduces the innovative potential of SMEs, and in consequence weakens their development.

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